

Remarks

Claim 4 is here amended to address informalities described in the Office Action dated July 28, 2005. Claim 11 is here amended to correct a clerical error. Support for these amendments is found in the claims as originally filed.

Claims 1-9 and 11 remain pending. Claim 10 was previously canceled. No new matter has been added, and no new material presented that would necessitate an additional search on the part of the Examiner. The Office Action withdraws rejection of claim 1 under 35 U.S.C. §102(e).

Arrangement of the Specification

In response to the objection to the specification for failing to include headings, Applicants assert that 37 C.F.R. 1.77(a) states an order of appearance, not a requirement for section headings. Further, 37 C.F.R. 1.77(b) indicates an order of sections of the application, not a requirement for section headings. Finally, Applicants submit, as evidence that section headings are not required, cited prior art reference U.S. patent number 6,657,659B1.

For these reasons, Applicants respectfully request that this objection be withdrawn.

Issues under 35 U.S.C. 103(a)

Claim 1

Claim 1 is directed to a camera for recording pictures. The camera has an image sensor for receiving a picture, a processing unit for processing the picture, and an end processing unit. Between the processing unit and the end processing unit, the camera contains a means

for removing light modulation between different fields of the picture by averaging images having the same light modulation. The means for removing light modulation also comprises a motion detector for detecting the effect of motion on a scene.

The Office Action rejects claim 1 under 35 U.S.C. §103(a) in view of Toyoda et al. (U.S. patent number 6,630,953, issued October 7, 2003) and Uematsu (U.S. patent number 5,892,551, issued April 6, 1999). Applicants characterize each reference, then analyze the combination of references.

Toyoda et al., U.S. patent number 6,630,953, issued October 7, 2003

Toyoda refers to a method of correcting flicker by detecting the mean luminance of two areas of a picture signal divided by a movable boundary. See Toyoda et al., column 1, lines 43-46. The flicker in each of the two areas is corrected to derive a correction-resultant area in response to the mean luminance. Ibid, column 1, lines 52-53. The two correction-resultant areas are then combined into a correction-resultant picture. Ibid, column 1, lines 55-57.

Toyoda fails to teach or suggest a method of averaging stored images to remove light modulation. Toyoda simply does not teach or suggest a method for using a light modulation removal means to detect the effect of motion on a scene, as was admitted in the Office Action dated July 28, 2005 (page 4, section 6).

Uematsu, U.S. patent number 5,892,551, issued April 6, 1999

Uematsu fails to cure the defects of Toyoda. Rather, Uematsu refers only to a method of using a flicker reducing circuit to output a processed display signal to a specific area of a picture with noticeable flicker. See Uematsu, column 3, lines 25-33. Uematsu's device stores

character data and composite data in a memory unit. Ibid, column 1, lines 28-32. This data is passed through a low-pass filter to remove flicker by removing high-frequency components of a spatial frequency in a vertical direction. Ibid, column 3, lines 17-19.

Uematsu fails to teach or suggest, or even mention averaging stored images having the same light modulation. Uematsu does not teach or suggest a method for detecting the effect of motion on a scene via the light modulation removal means.

For these reasons, claim 1 is not obvious in view of the combination of Toyoda and Uematsu. Applicants respectfully request that this rejection be withdrawn.

Claims 2-9

The Office Action dated July 28, 2005 (page 5, section 7) rejects claims 2-7 in view of Toyoda, Uematsu, and further in view of Callahan (U.S. patent number 6,380,985, issued April 30, 2002).

Callahan, U.S. patent number 6,380,985, issued April 30, 2002

Callahan refers a to system for filtering a data stream to produce a reduced-size display image while minimizing flicker. See Callahan, column 1, lines 46-49. The Callahan system contains a resizing and filtering component to remove and resize two fields of interlaced scan lines by averaging pairs of sequential scan lines, producing averaged line pairs. Ibid, column 5, lines 9-11. The component then filters the averaged line pairs to remove interlace flickering. Ibid, column 5, lines 13-17.

Callahan fails to teach or suggest any method for motion detection, as admitted by the Office Action dated May 4, 2005 (page 8, section 11). Callahan fails to teach or suggest a method for averaging stored images, and fails to teach or suggest averaging entire images

based on light modulation. Callahan also fails to teach or suggest means to correct consecutive images to the same temporal position using motion compensation techniques prior to the averaging, as admitted by the Office Action dated May 4, 2005 (page 9, section 12).

Callahan fails to cure the defects of Toyoda and Uematsu with respect to claim 1. Claim 2 depends from claim 1, and contains additional subject matter. As claim 1 is not obvious in view of the combination of Toyoda, Uematsu, and Callahan, thus claim 2 and claims 3-7 that depend directly or indirectly from claims 1 and 2 are not obvious in view of these references alone or in combination.

Applicants respectfully request that rejection of claims 2-7 under 35 U.S.C. 103(a) be withdrawn.

The Office Action rejects claim 8 as obvious in view of Toyoda, Uematsu, Callahan and Thompson et al. (U.S. patent number 6,489,998, issued December 3, 2002).

Thompson et al., U.S. patent number 6,489,998, issued December 3, 2002

Thompson refers to a digital image processor that contains a deinterlacing processor. Thompson's deinterlacing processor receives an interlaced video stream, stores portions of the interlaced video signal, and transmits a deinterlaced video stream. See Thompson, column 3, lines 1-5. This deinterlacing processor performs frequency analysis on the interlaced video stream to output deinterlaced video stream with reduced motion artifacts. Ibid, column 3, lines 5-8. Motion artifacts are detected by analyzing frequency information in a single video frame. Ibid, column 3, lines 12-14.

Thompson fails to teach or suggest averaging the different fields of dependence in motion, and/or locations with low respectively high luminance locations, as admitted in the Office Action dated July 28, 2005 (page 9, paragraph 1). Thompson does not teach or suggest averaging to determine a weighted average of horizontally adjacent detection values. Thompson does not teach or suggest averaging stored images with similar light modulation. Thompson simply does not mention a method of light modulation removal that also detects the effect of motion.

Claim 8 depends indirectly on claim 1 and contains additional subject matter. As Thompson fails to cure the defects of Toyoda, Uematsu and Callahan with respect to claim 1, claim 8 is not obvious in view of these references.

The Office Action rejects claim 9 as obvious in view of Toyoda, Uematsu, Callahan and Thompson et al. Claim 9 depends on claim 1 and contains additional subject matter. As Thompson fails to cure the defects of Toyoda and Uematsu with respect to claim 1, claim 9 also is not obvious in view of these references.

Applicants respectfully request that rejection of claims 8 and 9 under 35 U.S.C. 103(a) be withdrawn.

Claim 11

Claim 11 is directed to a method of removing light modulation during recording pictures with an image sensor. The method has steps of: receiving a picture, processing the picture, removing the light modulation by storing different fields of the picture and averaging the different fields in dependence of motion, and/or locations with low

respectively high luminance locations. The removing step also averages images having the same light modulation, and detects the effect of motion on a scene.

The Office Action rejects claim 11 under 35 U.S.C. §103(a) in view of Toyoda and Thompson and further in view of Uematsu and Van Rooy.

Toyoda refers to a method of removing light modulation by dividing a field into four areas, with a multiplier assigned to each area. Each of the four multipliers in Toyoda's device multiplies the output signal of an A/D converter by a gain factor to suppress or correct flicker in each of the four areas individually. See Toyoda, column 5, lines 10- 35. Each multiplier outputs a digital video signal to an area combining device. Ibid, column 5, lines 10-35. The area combining device chooses one from among the four output signals produced by the four multipliers. Ibid, column 5, lines 50-55.

Toyoda does not teach or suggest a method of storing images, as admitted in the Office Action dated July 28, 2005 (page 8, section 10). Toyoda fails to teach or suggest a method of averaging images with the same light modulation as a means of removing light modulation. The Office Action (page 9, paragraph 1) admits also that Toyoda and Thompson in combination fail to teach or suggest averaging the different fields in dependence of motion, and/or locations with low respectively high luminance locations.

Van Rooy, U.S. patent number 6,657,659, issued December 2, 2003

Van Rooy (U.S. patent number 6,657,659, issued December 2, 2003) refers to a method of compensating an image signal for AC light source induced fluctuations. See Van Rooy, column 2, line 43-46. The method in Van Rooy has steps of generating an average

signal representing the average image signal content over a period of time, and processing the image signal to obtain a corrected signal. Ibid, column 2, line 46-49.

Van Rooy fails to teach or suggest a method of detecting an effect of motion on a scene, as admitted in the Office Action dated July 28, 2005 (page 9, paragraph 2). In fact, the Office Action (page 9, paragraph 2) admits that Toyoda, Thompson and Van Rooy fail to teach or suggest a method of detecting the effect of motion on a scene. Therefore, Van Rooy fails to cure the defects of Toyoda alone, or in combination with Thompson.

The Office Action (page 9, paragraph 2) asserts that Uematsu teaches a flicker reducing circuit which removes noise through motion detection between a previous frame and the following frame, and a motion detection signal in motion detection. However, Uematsu fails to teach or suggest a method of detecting motion based on differences in light modulation between fields. Uematsu also fails to teach or suggest a method for removing light modulation by storing and averaging different fields of the picture in dependence of motion.

For these reasons, claim 11 is not obvious in view of the combination of Toyoda, Thompson, Van Rooy and Uematsu. Applicants respectfully request that this rejection be withdrawn.

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Amendment and Response to Office Action of July 28, 2005

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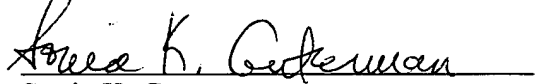
Summary

On the basis of the foregoing reasons, Applicants respectfully submit that the pending claims are in condition for allowance, which is respectfully requested.

If there are any questions regarding these remarks, the Examiners are invited and encouraged to contact Applicants' representative at the telephone number provided.

Respectfully submitted,

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